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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/883,966	06/20/2001	Koichi Numata	109237	4446
25944	7590	03/08/2006	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			HANDAL, KAITY V	
			ART UNIT	PAPER NUMBER
			1764	
DATE MAILED: 03/08/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/883,966

Applicant(s)

NUMATA ET AL.

Examiner

Kaity Handal

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 27-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/29/03, 6/20/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of claims 1-26 in the reply filed on 1/5/2006 is acknowledged. The traversal is on the ground(s) that the examiner has not established that a serious burden exists if restriction is not required. This is not found persuasive because establishing that the inventions are classified in different classes and/or subclasses establishes that a serious burden exists on the examiner if restriction is not required. The requirement is still deemed proper and is therefore made FINAL.

Specification

1. The disclosure is objected to because of the following informalities:

Page 3, lines 30-31, sentence does not read well.

Appropriate correction is required.

Page 4, reference number (34) is assigned to "filtering member", in line 8, whereas in line 12, reference number (34) is assigned to "partition."

Appropriate correction is required.

Page 7, in line 24, a space is needed between the word "second" and the word "embodiment."

Appropriate correction is required.

Claims 15 and 18 are objected to because of the following informalities: both claims read exactly the same. Appropriate correction is required.

Applicant is advised that should claim 15 be found allowable, claim 18 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 14-15, 17-18, and 21-23 are rejected under 35 U.S.C. 102(b) as being by Minet et al. (US 4,981,676).

With respect to claims 1, 14-15, 17-18, and 21-22, Minet teaches a fuel reforming apparatus (fig. 1) comprising: a reforming catalyst (17) that reforms raw gas including hydrocarbon fuel into reformed gas including hydrogen (col. 1, lines 11-16); and a filtering member/porous ceramic membrane (11) comprised of an interstitial material/support materials (col. 1, lines 31-34) including a plurality of gaps/pores having a diameter equal to or smaller than a selected effective diameter of 10-15 microns (col. 3, lines 40-53) which would therefore be effective in removing/trapping

soot, that carries the reforming catalyst (col. 1, lines 31-34) on at least one face of the filtering member/porous ceramic membrane (11) (col. 3, lines 53-55).

With respect to claim 2, Minet teaches wherein a raw material supply flow passage (16) that causes the raw gas to flow along a first face/inside reaction zone (16) of the filtering member/porous ceramic membrane (11) and that supplies the raw gas to the filtering member (illustrated); and a processed gas flow passage/interior (22) that causes reformed and filtered gas to flow along a second face of the filtering member/porous ceramic membrane (11).

With respect to claim 3, Minet teaches wherein: the raw material supply flow passage (16) causes the raw gas to flow along the first face of the filtering member/porous ceramic membrane (11) and substantially parallel thereto (as illustrated), and the processed gas flow passage/interior (22) causes the reformed and filtered gas to flow along the second face of the filtering member/porous ceramic membrane (11) and substantially parallel thereto (as illustrated).

With respect to claim 23, Minet teaches wherein said reforming catalyst (17) is carried by the filtering member/porous ceramic membrane (11) on at least one face thereof (col. 3, lines 52-55).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-10, 12-13, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minet et al. (US 4,981,676), as applied to claims 1 - 3 above, and further in view of LaPierre et al. (US 6,348,278 B1).

With respect to claims 4 and 6, Minet discloses all claim limitations as set forth above including a nickel catalyst deposited on alumina support materials (col. 1, lines 32-34). Minet fails to show wherein the raw material supply flow passage (16), the filtering member/porous ceramic membrane (11) and the processed gas flow passage/interior (22) are constructed using a monolithic carrier made from the interstitial material. LaPierre teaches a hydrogen production apparatus comprising an alumina monolithic carrier (col. 5, lines 49-53) for the same catalyst (col. 5, lines 65-67) in order to provide support for reforming catalyst (col. 5, lines 35-38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an alumina monolithic carrier in Minet's apparatus, as taught by LaPierre, in order to provide support for reforming catalyst.

With respect to claims 5, 8 and 13, LaPierre further teaches wherein the reforming catalyst is carried by the filtering member/wash-coated monolith matrix on the second face (col. 5, lines 39-43).

With respect to claim 7, Minet as modified teaches wherein the interstitial/support material forming the filtering member/porous ceramic membrane (11) is formed of a porous material.

With respect to claim 9, Minet as modified teaches wherein the first face of the filtering member on the side of the raw material supply flow passage is inactivated/made of alumina support (col. 5, lines 49-53).

With respect to claim 10, Minet teaches wherein the first face/inside reaction zone (16) of the filtering member/porous ceramic membrane (11) on the side of the raw material supply flow passage is inactivated by having an alumina support (col. 3, lines 38-55).

With respect to claim 12, Minet teaches wherein the reforming catalyst (17) is additionally carried by the filtering member/porous ceramic membrane (11) also on the first face on the side of the raw material supply flow passage/reaction zone (16).

With respect to claim 16, Minet as modified teaches wherein the interstitial/monolith/support material forming the filtering member/porous ceramic membrane (11) is formed of a porous material.

With respect to claim 20, Minet teaches wherein the interstitial/monolith/support material forming the filtering member/porous ceramic membrane (11) is formed of a porous material

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Minet et al. (US 4,981,676), as applied to claim 8 above, and further in view of Abe et al. (US 6,576,203 B2)

With respect to claim 11, Minet discloses all claim limitations as set forth above including the desire to generate hydrogen but fails to show wherein a partial

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oxidation catalyst that partially oxidizes the hydrocarbon fuel, wherein the partial oxidation catalyst is carried by the filtering member on the first face on the side of the raw material supply flow passage. Abe teaches a reformer having a partial oxidation catalyst that partially oxidizes the hydrocarbon fuel (page 5, paragraph [0094], lines 1-6), wherein the partial oxidation catalyst is carried by the filtering member of a honeycomb structure on the first face on the side of the raw material supply flow passage (page 6, paragraph [0105], lines 1-8) in order to generate hydrogen (page 5, paragraph [0094], lines 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a partial oxidation catalyst that partially oxidizes the hydrocarbon fuel, wherein the partial oxidation catalyst is carried by the filtering member, as taught by Abe, in order to generate hydrogen.

7. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minet et al. (US 4,981,676), as applied to claims 21-22 above, and further in view of Hwang et al. (US 4,522,894), and in view of Doty et al. (US 5,098,455).

With respect to claims 24-25, Minet discloses all claim limitations as set forth above including a nickel catalyst but fails to show wherein reformer comprises soot removing means. Hwang teaches power production wherein soot causes a rapid increase in reactor pressure drop when a nickel catalyst is employed (col. 17, lines 16-20). Doty teaches gas filter regeneration comprising soot removing means/glow

plug (fig. 1, 20) in order to burn off collected soot and regenerate filtering element (col. 5, lines 51-55) and therefore regenerate said nickel based catalyst.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide soot removing means to Minet's apparatus, as taught by Doty, in order to burn off collected soot on and regenerate filtering element and therefore regenerate said nickel based catalyst.

With respect to claim 26, Minet as modified teaches wherein the soot removing means/glow plug (fig. 1, 20) contacts soot that has been trapped by the soot trapping means with oxygen-containing gas/by means of burning (col. 5, lines 51-57).

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Minet et al. (US 4,981,676), as applied to claim 1 above, and further in view of Jahnke et al. (US 6,149,859).

With respect to claim 19, Minet discloses all claim limitations as set forth above but fails to show wherein said reformer comprises a raw material preparing portion that gasifies hydrocarbon fuel and that mixes air with water vapors to prepare raw gas. Jahnke teaches a gasifier (fig. 1, 10) that gasifies hydrocarbon fuel (5) and that mixes air (6) (col. 5, lines 1-8) with water vapors (col. 5, lines 21-25) in order to prepare synthesis gas (col. 5, lines 1-8).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a gasifier in Minet's apparatus, as taught by Jahnke, in order to prepare the synthesis gas.

Conclusion

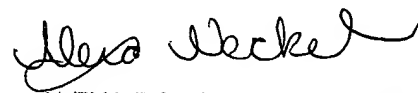
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KH 

2/22/2006


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PRIMARY EXAMINER